THE ARCHITECTS' AND MECHANICAL ENGINEERS' BOOK OF

YEOMANS PUMPS

FOR USE IN DRAINAGE, SEWAGE, WATER SUPPLY, CIRCULATION, BOILER FEED, CONDENSATION, AND AIR CONDITIONING

YEOMANS BROTHERS COMPANY · CHICAGO

YEOMANS BROTHERS COMPANY

MAKERS OF SEWAGE EJECTORS, PUMPING MACHINERY & AIR COMPRESSORS

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● THE LEADERSHIP OF YEOMANS PUMPS

Forty years of concentration upon pumping problems have built up within the Yeomans organization the knowledge, technique and engineering ability which have produced the various pumps described in this book.

Basically, all centrifugal pumps are alike and superficially simple. Apparently, any good machine shop should be able to produce them. Yet there is a wide difference between makes of pumps—a difference reflected in efficiency, life and acceptance. These differences are subtle but important. The means of achieving the best results are not so much a matter of mechanical skill as they are a matter of precision gained through long experience.

There, Yeomans excels, for Yeomans has specialized on pumps of all types. It has pioneered many of them. Today, Yeomans Pumps represent the highest development in pumping equipment. An examination of these pumps reveals refinements not to be found elsewhere—features that reflect the ingrained skill of Yeomans designers and craftsmen.

Architects and engineers the world over have endorsed and specified Yeomans equipment, and the thousands of successful installations bear eloquent testimony to Yeomans quality, experience and leadership.

● YEOMANS SERVICE TO ARCHITECTS

To aid the architect and engineer in the selection of the proper pump for any type of building, Yeomans has developed a capable service organization in 53 cities throughout the country. This organization has been an important factor in maintaining the excellent record for durability and performance of Yeomans Company pumps.

All Yeomans engineers and representatives are widely experienced in analyzing pumping problems and are able to give prompt and intelligent service. Architects and engineers place themselves under no obligation by permitting Yeomans Brothers Company or its representatives to submit suggestions regarding pumping equipment. Such service is gladly given—without cost.

● THE YEOMANS GUARANTEE

A successful pump installation depends not only on excellent workmanship, but also on thorough care in installation. Both must be of the best for maximum efficiency and reliable service. In Yeomans pumps both are assured—by skillful manufacture —by a thoroughly experienced service organization.

Yeomans Brothers Company takes full responsibility for the satisfactory operation of any Yeomans pump installed according to recommendations. The established character and integrity of the company make that responsibility valid.

YEOMANS BROTHERS COMPANY
1419 DAYTON STREET, CHICAGO, ILL.

PUMPS WHERE AND WHY THEY ARE USED

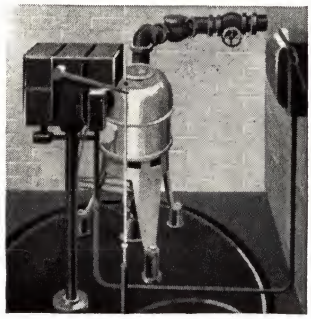
THE THREE FUNCTIONS OF PUMPS
IN BUILDING CONSTRUCTION

While there are three general pump functions, and several distinct pump types, it is the nature and size of the service rather than the design of the pump itself which decide pump selection. For example, the same pump may appropriately serve all three functions, depending on the conditions—or—three pumps may be offered for one service, again depending on the conditions. The lines are not definitely divided, yet this fact need not be confusing; this booklet makes clear the proper selection for each service.

Briefly, pump problems are divided into three groups. These are

1. Drainage and Sewage
2. Water Supply and Circulation
3. Heating Systems

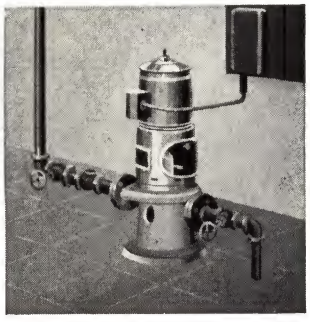
1. DRAINAGE AND SEWAGE PUMPING



Drainage pumps—called cellar drainers in the smaller sizes—also bilge or sump pumps, are used wherever it is necessary to raise floor drainage, seepage, flood or back waters from sumps, catch basins, or other points below street sewers. Wastes from showers, laundry trays, boiler blow-off—wastes which contain no appreciable solids—can be readily removed by these pump units.

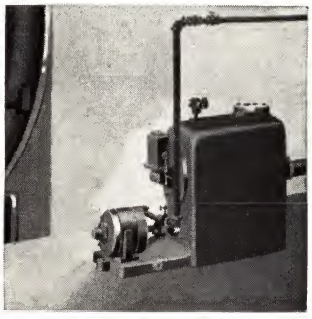
Sewage pumps—also known as ejectors—are used to elevate drainage and sewage, usually the waste from one or more water closets.

2. PUMPS FOR WATER SUPPLY AND CIRCULATION



These pumps may be classified according to their various uses.
Water Supply
Domestic hot water circulation
Drinking water circulation
Cooling water circulation
Swimming pool water circulation
Brine circulation
Air washer water circulation

3. PUMPS FOR HEATING SYSTEMS



These pumps are called condensation or return pumps. They are used to return to the boiler the steam that condenses below boiler water level. They are used in high- or low-pressure steam or vapor systems.

DRAINAGE AND SEWAGE

HANDLING OF DRAINAGE AND SEWAGE BELOW STREET SEWER LEVELS

In many localities the street sewers are small and shallow, necessitating the elevating of sewage and waste waters to the sewer, which is done only with pumps. To remove drainage, and to prevent accumulating water and waste from becoming a menace to health and property, an automatic drainer, bilge, or sump pump is installed. This pump, located in a sump or catch basin into which the waste waters drain, operates automatically, pumping the water from the sump basin to the sewer—the controls starting and stopping the electric motor as the level of the liquid rises and falls in the basin.

The process for removing sewage is identical. In this case, a sewage pump or ejector is used. It should have a non-clogging impeller designed to pump not only drainage, but also solids, such as toilet waste, mud, sand, stones, rags, etc.

PUMPS HOW TO SELECT THEM

CONTROLLING FACTORS IN PUMP SELECTION

While many charts and guides have been devised to aid in the selection of drainage and sewage pumps, the conditions alone determine the exact pump to fit a given duty. Many factors influence the decision such as

(1) The nature of the area to be drained
(2) The type of suspended matter in waste waters
(3) The distance below sewer level
(4) Extent of waterproofing in basement

A large safety factor to offset the unexpected should be included, since the safety of property and equipment may depend entirely upon the ability of the pumps to dispose of drainage and sewage. Unusual flood conditions can tax the capacity of the pump beyond its ability.

HOW TO CALCULATE THE DISCHARGE HEAD:

To arrive at the discharge head of a drainage pump or sewage ejector, measure the distance from the bottom of the sump or catch basin to the highest point in the discharge line to the sewer. Then add 1 ft. friction loss for each 20 ft. of discharge pipe. Thus, in the illustration below, the discharge head is figured as follows:

Distance A (Static head) ..... 20 ft.

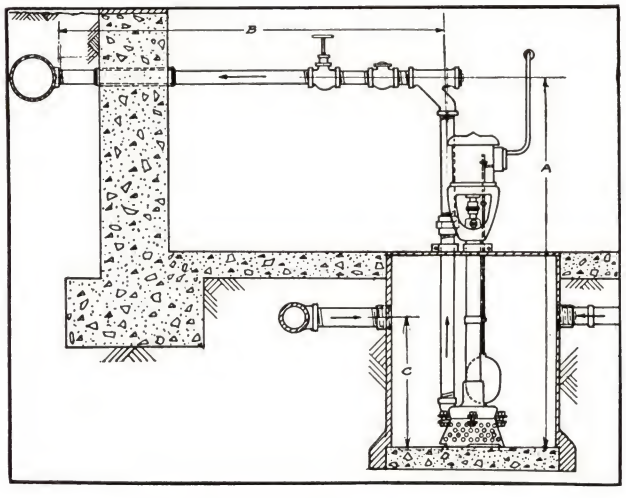
Friction loss. Length of discharge pipe (A+B) app. 40 ft.. 2 ft.

Total discharge head ..... 22 ft.

DETERMINING DEPTH OF BASIN

(SEWAGE AND DRAINAGE)

To allow ample storage of sewage, drainage, etc., provide at least 3 ft. (C) of depth below lowest inlet to the catch basin or sump. This will give reasonably long cycles of pump operation and idleness. It will eliminate too-frequent starting and stopping of apparatus, which causes unnecessary wear and reduces the life of the equipment.



THE APPROXIMATE FLOW FROM VARIOUS PLUMBING FIXTURES

(TO DETERMINE CAPACITY)

The following table gives the approximate flow in gallons per minute from various plumbing fixtures.

	per fixture
Lavatory—two 3/8 inch connections	5 GPM
Bath Tub—two 1/2 inch connections	8 GPM
Kitchen or Pantry sink—two 1/2 inch connections	5 GPM
Shower—overhead spray only—two 1/2 inch connections	10 GPM
Shower—with side sprays in addition to overhead spray connections	20 GPM
Slop sink—two 1/2 inch connections	6 GPM
Slop sink—two 3/4 inch connections	10 GPM
Laundry tray—two 1/2 inch connections	10 GPM
Water Closet—tank type—one 3/8 inch connection	5 GPM
Water Closet—Flush Valve—one 1 inch or 1 1/4 inch connection	30 GPM
Urinal stall—one 3/8 inch connection	1/2 GPM
Drinking Fountain—one 3/8 inch connection	1 GPM
Floor Drains each	1 GPM

Drain Tile. In clay or slow-seeping ground figure approximately 1 GPM per 100 sq. ft. of area. In sand and new made ground figure at least 5 GPM. Final calculations will depend upon nature of soil and other varying conditions.

USE FACTOR FOR DIFFERENT TYPES OF BUILDINGS

Deduct percentages given below from total GPM arrived at as illustrated in the typical example below:

Schools	25%
Mercantile Buildings	40%
Hospitals	25%
Office Buildings	50%
Private Residences	60%
Hotels and Clubs	40%
Apartment Buildings and Apartment Hotels	40%

A TYPICAL EXAMPLE

Suppose that in an apartment building the basement fixtures which cannot drain directly to the street sewer consist of one slop sink (6 GPM); two laundry trays (20 GPM); two water closets (60 GPM); one shower (10 GPM); ten floor drains (10 GPM)—a total of 106 GPM. As indicated above reduce the total pumpage in the building by 40%, making a new total of 64 GPM. Adding a 50% margin of safety, we find that an ejector—because of the water closet waste—of 100 GPM capacity should be used.

Assuming that the catch basin inlet enters at 2 ft. below the floor, and that the bottom of the basin is 3 ft. below the inlet, a basin depth of 5 ft. is the solution. If the sewer is 8 ft. above the floor and friction amounts to 2 additional ft., a total head of 15 ft. must be met.

By referring to the selection charts on page 9, the proper ejector unit can easily be selected.

The same procedure applies to the selection of bilge pumps. Use the selection chart on page 7.

YEOMANS PUMPS FOR DRAINAGE DISPOSAL

YEOMANS "DRAIN-DRI" PUMPER

A STURDY, RUST-PROOF PUMP . . . THE KING OF ALL CELLAR DRAINERS

"DRAIN-DRI" is a trouble-proof cellar drainer that is used in garages, residences, factories, elevator pits, coal pits, or wherever it is necessary to remove a relatively small amount of drainage (up to 50-60 GPM and heads up to 20-25 ft.) from a point below the level of the sewer.

While most drainers are fundamentally alike, architects find in "Drain-Dri" a more dependable pump. Probably its greatest virtue lies in its ability to perform whenever necessity arises—day or night—year in, year out. A sticky electrical control or rusted impeller is unknown in "Drain-Dri", for the control is of the dependable industrial type, and the impeller is of the same type as is used on Yeomans sewage ejectors or sewage pumps.

HERE'S HOW IT OPERATES

As the drainage in the sump or basin rises, it lifts the hard rubber float. When drainage has accumulated in the basin to a predetermined level, the float switch automatically starts the motor and pump. As the drainage is pumped out of the basin, the float descends with the falling level of drainage, automatically opening the control switch until the basin has again filled with drainage.

YEOMANS "ADJUSTO" SPLIT CAST IRON COVER

"Drain-Dri" units can be installed in cast iron, steel, concrete, tile, or brick catch basins. Where required by local ordinances, "Drain-Dri" can be furnished with "Adjusto" split cast iron cover. Cover is readily removable without interference to discharge pipe or drainer, permitting easy access to pump and pit.

"Adjusto" covers are available for sump diameters of 18", 20", 24", 30" and 36", for all units listed.

"Drain-Dri" with "Adjusto" cover is known as Model "Y".

"Drain-Dri" without "Adjusto" cover is known as Model "B". All sizes of this type will fit in sump as small as 12" in diameter.

Used on Model "Y" only

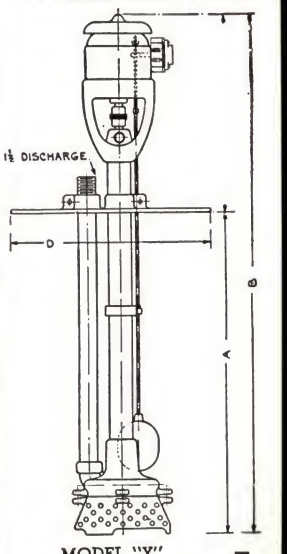
FEATURES OF THE "DRAIN-DRI" DRAINER:

MOTOR: A guaranteed ball bearing capacitor type motor operates the "Drain-Dri". It runs without radio interference, is brushless, quiet and enclosed for moisture protection. **CONTROL:** Cutler-Hammer enclosed, heavy duty float switch with hand reset overload relay. Operates even after long neglect. **PUMP BEARINGS:** Grease lubricated ball-thrust type, easily removable. Also a sealed self-lubricated sleeve bearing is easily removable. **CORD AND PLUG:** Belden cord, unbreakable soft rubber plug. **SHAFT:** Extra large, of polished steel. **COUPLING:** Lovejoy flexible, assuring vibrationless operation. **FLOAT:** Polished, sealed hard rubber, waterproof and acidproof. **SCREEN:** Rustless, galvanized cast iron, not of easily damaged wire mesh. **IMPELLER:** An outstanding feature. Is hand-finished, balanced, non-clogging type, not the little paddle wheel found in most drainers. Delivers more gallons with less power. See tables. **WEIGHT:** Weight indicates value. "Drain-Dri" is the heaviest drainer made. **RUST RESISTANCE:** Hot dipped galvanized body, hard rubber float, sealed shaft, enclosed motor.

DIMENSIONS APPLY TO BOTH MODEL "B" AND MODEL "Y"

Head in Feet	Max. Gals. per Hour Capacity		Size and No.		Normal Sump Depth-Ft.	*Dimension "A" Max. Sump Depth	Dimension "B" Height of Pump		Dimension "D" Diameter of "Adjusto" Cover	Size Discharge Connection In.
	¼ HP Unit	½ HP Unit	¼ HP Unit	½ HP Unit			¼ HP Unit	½ HP Unit		
5	3400	5200	D 2	SD 2	2	2′ 4″	3′11″	4′1″	Determined by diameter of sump. Available in 20″, 22″, 28″, 34″ and 40″ sizes.	1½
8	3200	5000	D 3	SD 3	3	3′ 4″	4′11″	5′1″		1½
10	3100	4800	D 4	SD 4	4	4′ 4″	5′11″	6′1″		1½
12	2900	4650	D 5	SD 5	5	5′ 6″	7′ 1″	7′3″		1½
15	2500	4350	D 6	SD 6	6	6′ 6″	8′ 1″	8′3″		1½
18	1800	3800	D 7	SD 7	7	7′ 8″	9′ 3″	9′5″		1½
20	1200	3500	D 8	SD 8	8	8′ 8″	10′ 3″	10′5″		1½
22	600	3000	D 9	SD 9	9	9′ 8″	11′ 3″	11′5″		1½
25		2200	D10	SD10	10	10′10″	12′ 5″	12′7″		1½
28		1200	D11	SD11	11	11′10″	13′ 5″	13′7″		1½
30		600	D12	SD12	12	12′10″	14′ 6″	14′7″		1½

*Dimensions apply to both ¼ and ½ H.P. Units.

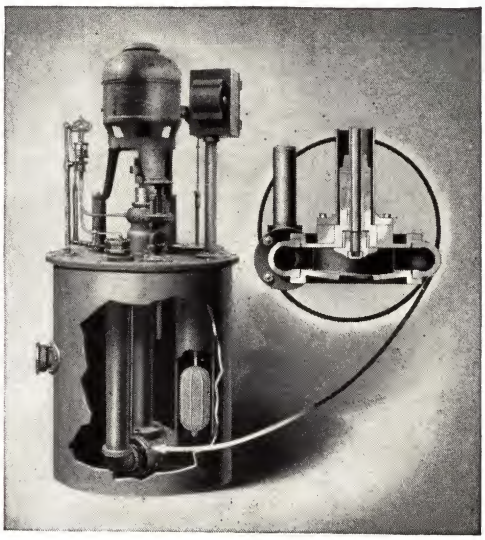


MODEL "Y" with "Adjusto" Cover

YEOMANS PUMPS FOR SEWAGE DISPOSAL

YEOMANS SCREENLESS SEWAGE EJECTORS

ENDORSED BY ARCHITECTS AND ENGINEERS THE WORLD OVER



SINCE 1898 Yeomans has specialized in the building of centrifugal pumps for sewage and heavy liquid disposal. That these pumps have given dependable, efficient service is proven by Yeomans acceptance the world over.

Yeomans Screenless Ejectors are widely used in deep basements, disposal works and industrial plants. A common application is in the pumping of liquids containing solids, etc. Unlike suction-type sewage pumps, Yeomans Submerged Screenless Ejectors handle high temperature liquids.

SINGLE AND DUPLEX INSTALLATIONS

Yeomans Screenless Sewage Ejectors are built for single or duplex installations. In the duplex ejectors, the control is so arranged that if one unit fails to handle the inflow, the other unit will cut in automatically, and in the event of inflow exceeding the capacity of one unit, the combined capacities of both units will be delivered.

EXTRA EQUIPMENT

Yeomans Screenless Sewage Ejectors can be furnished with extra equipment that increases the life of the pump. This extra equipment is briefly described on page 7. Additional information will gladly be sent on request.

HOW THE SCREENLESS EJECTOR OPERATES

This unit consists of a centrifugal non-clogging ejector located near the bottom of the sump or catch basin, and directly connected to a vertical shaft, enclosed in a suspension pipe, to an electric motor mounted on the sump cover.

As the basin fills with drainage and sewage, the copper float automatically rises. (See illustration.) The float operated automatic starter controls the starting and stopping of the motor—the pump functioning in accordance with the rise and fall of liquid in the basin.

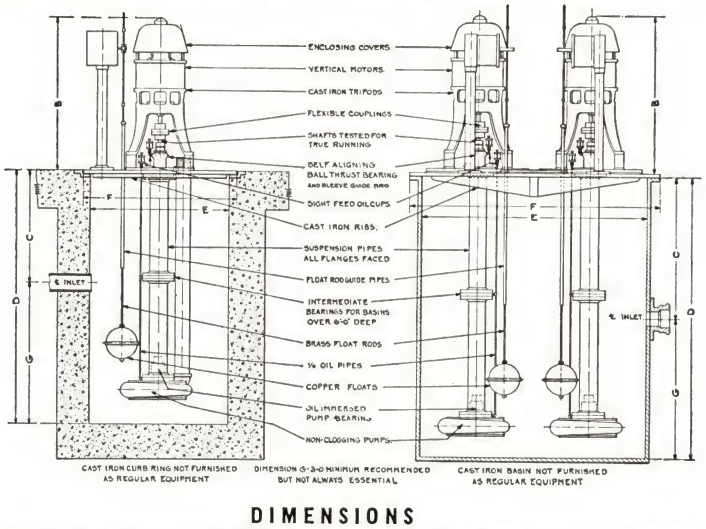
FEATURES

All of the features listed on page 6 under Yeomans Heavy Duty Bilge Pumps also apply to Yeomans Screenless Sewage Ejectors. Note, too, the following additional features:

Impeller: Yeomans 2-blade non-clogging impeller will readily pass rags and solids. This feature results from a design embodying unusual blade width, large water passages and rounded forward blade ends. There are but two waterways in this impeller and no hubs or vanes to obstruct the entrance—thus eliminoting a common source of trouble found in ordinary centrifugal pumps.

No inlet check valves: These ejectors are capable of continuous rated capacity because there is no stoppage of inflow into basin while pumps are operating. No screens are required on inlets to basin, ejector casings or in discharge piping, thus assuring freedom from clogging

Note: Yeomans self-priming device is available for all horizontal pumps operating with a suction lift.



DIMENSIONS

Ejector Number	Size Discharge A	B Approx.	C	D	SINGLE E	SINGLE F	SINGLE Bolt* Holes	SINGLE Dia. Bolt Circle	DUPLEX E	DUPLEX F	DUPLEX Bolt* Holes	DUPLEX Dia. Bolt Circle
8415 to 8435	4″	48″	Determined By Depth of Drains		36″	40″	4-⅝″	38″	48″	54″	4-⅝″	51″
8515 to 8535	5″	51″			48″	54″	4-⅝″	51″	60″	65″	4-¾″	63″
8625 to 8635	6″	54″			48″	54″	4-⅝″	51″	60″	65″	4-¾″	63″

*Bolt Holes Drilled ⅛″ Larger Than Bolts

YEOMANS PUMPS FOR SEWAGE DISPOSAL

TYPICAL SPECIFICATION

SCREENLESS SEWAGE EJECTOR

SEWAGE EJECTOR: Furnish and install where indicated on plans, one Yeomans No. ..... Single (or Duplex) Automatic Screenless Sewage Ejector having a capacity of ..... G.P.M. (for duplex set add ..... each unit) against a head of ..... feet.

MOTOR: Ejector shall be directly connected to..... H.P. vertical ball bearing motor operating at not over.....R.P.M. and suitable for.....current .....volts.....phase.....cycle.

AUTOMATIC CONTROL: Automatic control equipment shall consist of enclosed float switch and an enclosed safety switch, mounted on pipe stand on basin cover, and shall include fuses, phase protective device for polyphase motor and across-the-line type or resistance starter if size of motor requires it. Float switch shall be actuated by heavy copper float with guided brass rod. (For duplex installations add.....and Yeomans sequence changer.)

COVER PLATE: Catch basin cover shall be gas tight and suitable for basin opening of.....inches in diameter. Provide flanged opening in cover for vent and 11"x15" manhole with cast iron cover.

WIRING: Power wires will be brought to outlet within 10 feet of pump location by another contractor. All connections from this point to be made by contractor installing pump.

EXTRA EQUIPMENT: If extra equipment is desired it should be individually called for in the specifications.

DUPLEX INSTALLATIONS: Specifications for duplex Ejectors same as for Single Ejector. Note exception below:

COVER PLATE: Main catch basin cover shall be gas tight and suitable for opening.....inches in diameter, with separate ejector suspension plates with surfaces for motor supports and bearings, and suspension pipes shall be so arranged that one unit may be removed without disturbing the other. Provide flanged opening in cover for vent and 11"x15" manhole with cast iron cover.

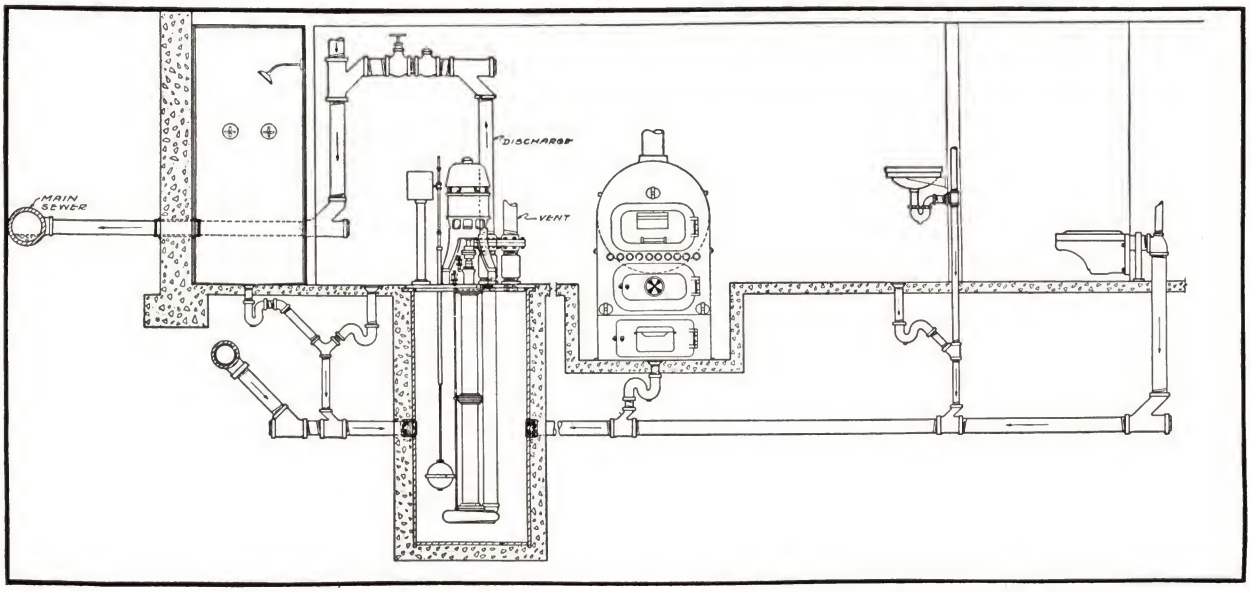
SCREENLESS EJECTOR SELECTION TABLE—1150 R.P.M.

Selection table below gives Pump No., Model Code Word and Horsepower of Motor required.

Pump Cap. G.P.M.	Discharge Size	TOTAL HEAD IN FEET										
		10	15	20	25	30	35	40	45	50	60	75
75	4"	8415 YBCEA ¾ H.P.	8415 YBCEB 1 H.P.	8425 YBCEC 1½ H.P.	8425 YBCED 2 H.P.	8425 YBCEE 3 H.P.	8425 YBCEF 3 H.P.	8425 YBCEG 5 H.P.	8425 YBCEH 5 H.P.	8435 YBCEI 5 H.P.	8435 YBCEIJ 7½ H.P.	8435 YBCEK 10 H.P.
100	4"	8415 YBCFA ¾ H.P.	8415 YBCFB 1 H.P.	8425 YBCFC 1½ H.P.	8425 YBCFD 2 H.P.	8425 YBCFE 3 H.P.	8425 YBCFF 3 H.P.	8425 YBCFG 5 H.P.	8425 YBCFH 5 H.P.	8435 YBCFI 5 H.P.	8435 YBCFJ 7½ H.P.	8435 YBCFK 10 H.P.
125	4"	8415 YBCGA ¾ H.P.	8415 YBCGB 1 H.P.	8425 YBCGC 1½ H.P.	8425 YBCGD 2 H.P.	8425 YBCGE 3 H.P.	8425 YBCGF 5 H.P.	8425 YBCGG 5 H.P.	8425 YBCGH 5 H.P.	8435 YBCGI 7½ H.P.	8435 YBCGJ 7½ H.P.	8435 YBCGK 10 H.P.
150	4"	8415 YBCHA ¾ H.P.	8415 YBCHB 1½ H.P.	8425 YBCHC 2 H.P.	8425 YBCHD 2 H.P.	8425 YBCHE 3 H.P.	8425 YBCHF 5 H.P.	8425 YBCHG 5 H.P.	8435 YBCHH 5 H.P.	8435 YBCHI 7½ H.P.	8435 YBCHJ 7½ H.P.	8435 YBCHK 10 H.P.
175	4"	8415 YBCIA ¾ H.P.	8415 YBCIB 1½ H.P.	8425 YBCIC 2 H.P.	8425 YBCID 3 H.P.	8425 YBCIE 3 H.P.	8425 YBCIF 5 H.P.	8425 YBCIG 5 H.P.	8435 YBCIH 7½ H.P.	8435 YBCII 7½ H.P.	8435 YBCIJ 10 H.P.	8435 YBCIK 15 H.P.
200	4"	8415 YBCJA 1 H.P.	8425 YBCJB 1½ H.P.	8425 YBCJC 2 H.P.	8425 YBCJD 3 H.P.	8425 YBCJE 3 H.P.	8425 YBCJF 5 H.P.	8425 YBCJG 5 H.P.	8435 YBCJH 7½ H.P.	8435 YBCJI 7½ H.P.	8435 YBCJJ 10 H.P.	8435 YBCJK 15 H.P.
225	4"	8415 YBCKA 1 H.P.	8425 YBCKB 1½ H.P.	8425 YBCKC 2 H.P.	8425 YBCKD 3 H.P.	8425 YBCKE 5 H.P.	8425 YBCKF 5 H.P.	8425 YBCKG 5 H.P.	8435 YBCKH 7½ H.P.	8435 YBCKI 7½ H.P.	8435 YBCKJ 10 H.P.	8435 YBCKK 15 H.P.
250	5"	8515 YBCLA 1 H.P.	8525 YBCLB 1½ H.P.	8525 YBCLC 3 H.P.	8525 YBCLD 3 H.P.	8525 YBCLE 5 H.P.	8525 YBCLF 5 H.P.	8525 YBCLG 5 H.P.	8535 YBCLH 7½ H.P.	8535 YBCLI 7½ H.P.	8535 YBCLJ 10 H.P.	8535 YBCLK 15 H.P.
275	5"	8515 YBCMA 1½ H.P.	8525 YBCMB 2 H.P.	8525 YBCMC 3 H.P.	8525 YBCMD 3 H.P.	8525 YBCME 5 H.P.	8525 YBCMF 5 H.P.	8525 YBCMG 5 H.P.	8535 YBCMH 7½ H.P.	8535 YBCMI 7½ H.P.	8535 YBCMJ 10 H.P.	8535 YBCMK 15 H.P.
300	5"	8515 YBCNA 1½ H.P.	8525 YBCNB 2 H.P.	8525 YBCNC 3 H.P.	8525 YBCND 5 H.P.	8525 YBCNE 5 H.P.	8525 YBCNF 5 H.P.	8535 YBCNG 7½ H.P.	8535 YBCNH 7½ H.P.	8535 YBCNI 7½ H.P.	8535 YBCNJ 10 H.P.	
350	5"	8525 YBCPA 1½ H.P.	8525 YBCPB 2 H.P.	8525 YBCPC 3 H.P.	8525 YBCPD 5 H.P.	8525 YBCPE 5 H.P.	8525 YBCPF 5 H.P.	8535 YPCPG 7½ H.P.	8535 YBCPH 7½ H.P.	8535 YBCPI 10 H.P.	8535 YBCPJ 15 H.P.	
400	6"	8625 YBCRA 2 H.P.	8625 YBCRB 3 H.P.	8625 YBCRC 3 H.P.	8625 YBCRD 5 H.P.	8625 YBCRE 5 H.P.	8635 YBCRF 7½ H.P.	8635 YBCRG 7½ H.P.	8635 YBCRH 7½ H.P.	8635 YBCRI 10 H.P.	8635 YBCRJ 15 H.P.	
500	6"	8625 YBCTA 3 H.P.	8625 YBCTB 5 H.P.	8625 YBCTC 5 H.P.	8625 YBCTD 5 H.P.	8635 YBCTE 7½ H.P.	8635 YBCTF 7½ H.P.	8635 YBCTG 7½ H.P.	8635 YBCTH 10 H.P.	8635 YBCTI 15 H.P.	8635 YBCTJ 15 H.P.	
600	6"	8635 YBCUA 3 H.P.	8635 YBCUB 5 H.P.	8635 YBCUC 5 H.P.	8635 YBCUD 7½ H.P.	8635 YBCUE 7½ H.P.	8635 YBCUF 7½ H.P.	8635 YBCUG 10 H.P.	8635 YBCUH 10 H.P.	8635 YBCUI 15 H.P.	8635 YBCUJ 15 H.P.	

The above table shows only a representative group of Yeomans Screenless Sewage Ejectors. Other standard units are furnished in larger or smaller sizes at 850, 1150, 1450 and 1750 R. P. M. (Higher or lower motor speeds are available as special equipment.)

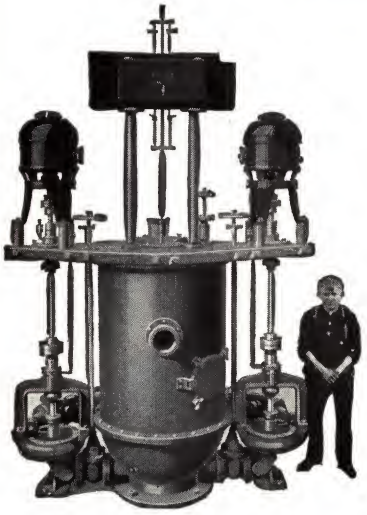
● TYPICAL BASEMENT DIAGRAM WITH DRAINAGE AND SEWAGE CONNECTIONS



YEOMANS PUMPS FOR SEWAGE DISPOSAL

YEOMANS FORM "A" DUPLEX SCREENLESS EJECTOR

A COMPLETE SEWAGE PUMPING PLANT



Form "A"—Screenless Centrifugal Sewage Ejector

Form "A" ejectors are recommended for use in office buildings, bank buildings, hotels, hospitals, public buildings, and in municipalities where conditions require that the pump handle drainage and sewage from low levels.

One of the most important features of Form "A" is its accessibility and the fact that it is a complete pumping plant, with receiver, complement of valves, etc. The cast iron sewage receiver is located in the center of a dry pit built of concrete or steel embedded in concrete. In the dry annular space between the receiver and the ejector pit is located a Form "A" Ejector, with suctions connected to the bottom of the receiver, and with discharge connections brought together in a double branch fitting. Special flush-back check valves are provided on the discharge of each unit. For additional safeguards, gate valves are installed on the suction and discharge of each pump.

Form "A" is equipped with automatic lubrication and high water alarm. It will handle drainage at boiling point, and assures low maintenance cost and low power consumption. Capacities 100-600 GPM each unit and larger. Heads up to 100 feet and higher.

A few typical installations follow: First National Bank, Boston; Bell Telephone Bldg., St. Louis; Elks Club, Los Angeles; Ritz-Carlton Hotel, Philadelphia; Tutweiler Hotel, Birmingham; Palace Theatre, New York; Chicago Tribune Tower; Masonic Temple, Topeka; Adolphus Hotel, Dallas. Write for Bulletin 2400.

THE YEOMANS NON-CLOGGING IMPELLER

Yeomans Non-clogging Impeller

This impeller is used in the submerged type screenless ejector described on page 8, and also in the Form "A" Ejector described on this page. It is truly non-clogging as there are but two waterways through the impeller and no hubs or vanes to obstruct the entrance. Because of unusual blade width, large water passages and rounded forward blade ends, it will pass rags and solids only slightly smaller than the discharge orifice, eliminating screens of all kinds.

"Yeomalite treatment" coats the impeller and protects it against rust and corrosion, acid, alkali, and abrasion. It increases efficiency by reducing friction losses, thus saving power.

THE SHONE SYSTEM OF SEWAGE EJECTION

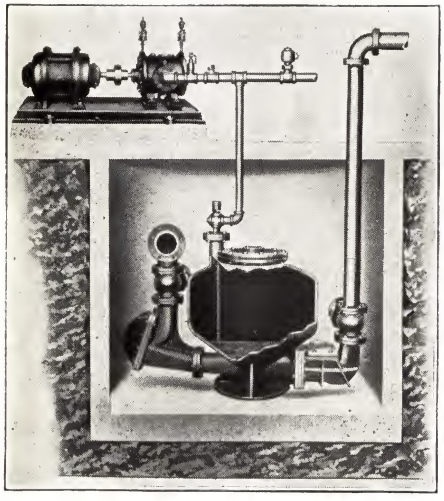
The Shone Sewage Ejector was invented over fifty years ago by Isaac Shone, a noted English sanitary engineer. Since then, with few changes in design, it has been accepted as the standard sewage ejector by leading engineers. It is not only the oldest but the most modern ejector on the market today. Capacities range from 50-600 GPM, heads, up to 75 feet.

Shone Ejectors are used in large office buildings, hotels, industrial plants, municipal sewerage systems and government buildings. They are especially desirable for use where compressed air is required for other purposes within the building. The Shone Ejector consists of a closed sewage receiver or pot with complement of gate and check valves and automatic bronze air valves, motor driven air compressor and automatic control. The sewage from the drains enters the vented ejector and when the receiver is full, the automatic bronze air valves are actuated, admitting compressed air to the receiver which in turn discharges the contents to the street sewer.

A few typical installations follow: Union Station, Chicago; Federal Reserve Bank, Houston; Philadelphia Convention Hall; Chase National Bank, New York; Sears-Roebuck, Washington; Hotel Gibson, Cincinnati; Book-Cadillac Hotel, Detroit; U. S. Post Offices, Sacramento, Calif., Camden, N. J., Pittsburgh; Tyler, Texas; Dept. of Commerce, Washington; Dept. of Labor Bldg., Washington; Municipal installations include Cedar Rapids, Iowa, Dayton, Ohio; Dallas, Texas; Milwaukee, Wis.

Architects and engineers desiring information are requested to write for Bulletin 4000 and 4050.

Shone System Pneumatic Sewage Ejector



Electrically Controlled Ejector

This newest Shone has NO MOVING PARTS on or inside the ejector—the only ejector dispensing with such accessories. High efficiency, lower first cost and maintenance, are characteristic. Bulletin 4050.

WATER SUPPLY FOR BUILDINGS

For more than 38 years Yeomans has been called upon to solve difficult problems involving water supply. The experience gained in thousands of successful installations is represented in the pumps described on the following pages.

It is hoped that the brief description, together with the chart below, will be of decided help to the architect or engineer in the selection of pumps for water supply.

TYPES OF WATER SUPPLY SYSTEMS

There are three types of water supply systems in general use today. Let us analyze them one at a time.

GRAVITY SYSTEM

In the gravity system, the open storage tank is placed on or above the roof, usually in a pent house. The water supply pump, generally located in the basement, pumps the water to this tank from which water is supplied to the various fixtures in the building, by gravity.

PRESSURE SYSTEM

In the pressure system, the closed storage tank is generally located in the basement together with the pump, thus eliminating the construction of roof tanks. The water is forced into the supply lines by means of pressure built up by the pump with the aid of an air cushion in the storage tank.

TANKLESS BOOSTER SYSTEM

In this system, the tank, air compressor, complex piping and valving are eliminated. The tankless booster system consists of simple piping, a balanced impeller pump, and an automatic electric pressure regulator that cuts in the pump when city pressure is inadequate to supply all fixtures and cuts it out when city pressure is restored.

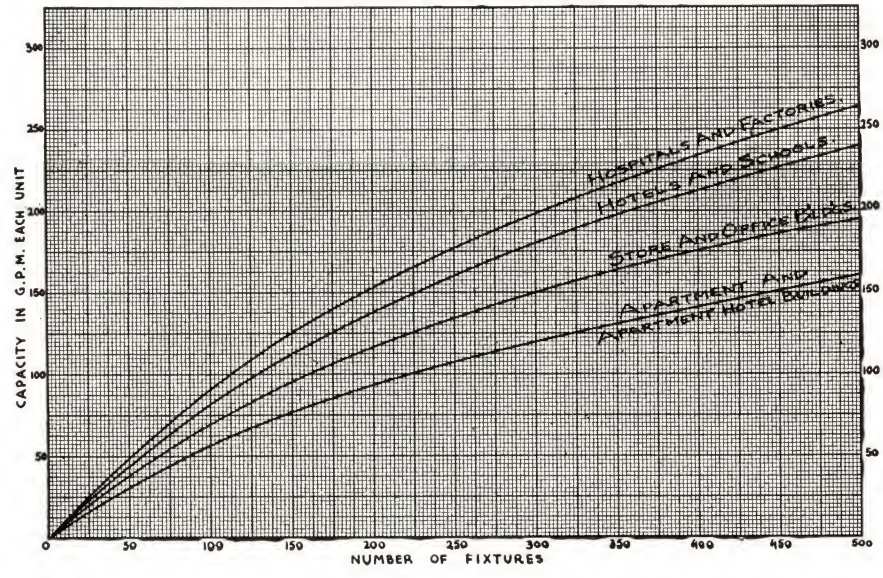
HOW TO SELECT THE PROPER PUMP

In order to select the proper pump for water supply, two things must be known, the capacity required for each pump, and secondly, the discharge head. The chart below gives pump capacities in gallons per minute for various types of buildings, depending on the total number of fixtures. The problem of calculating the discharge head is discussed below.

HOW TO CALCULATE THE DISCHARGE HEAD

In the centrifugal type of pump, the pump derives the benefit of city pressure, and when determining net head or pressure required of pump, deduct city pressure, figuring 2.3 ft. for each pound of pressure. This applies to all three systems.

CHART FOR FIGURING PUMP CAPACITY FOR VARIOUS TYPES OF BUILDINGS.



GRAVITY SYSTEM

Figure vertical distance from pump to top of roof tank. Assuming proper sized risers and branches are used, friction will be slight. Deduct from total elevation, city pressure figured at 2.3 feet per pound pressure. The result is the net head required of the pump.

PRESSURE SYSTEM

Figure vertical distance from pump to highest fixture. Add pressure regulation of 10-20 pounds above minimum pressure. Add pressure required at highest fixture. Deduct minimum city pressure.

TANKLESS BOOSTER

In the tankless type system, the pump serves merely as a booster to the city pressure. The pressure regulator is set to cut in the pump when city pressure drops slightly below that required to supply ample pressure at top floor fixtures, and to cut out the pump when city pressure is restored. Figure net pressure on the pump as previously described.

YEOMANS PUMPS FOR WATER SUPPLY

THE "TURRET" PUMP . . . FITS RIGHT IN THE PIPE LINE

WHERE THE "TURRET" PUMP IS USED

In the "Turret" Pump, Yeomans has developed an aggressive and worthy competitor to the familiar horizontal split case centrifugal pump. For here is a pump that fits right in the pipe line. In the smaller sizes, no support is needed; in the larger models, no built up foundation is necessary. The motor is on top, away from floor dirt and moisture. Also, the "Turret" Pump takes but little space. Capacities range from 10-600 GPM, and heads from 10 to 300 feet.

Lighter, more compact, more efficient, the "Turret" Pump is ideal for water supply. It can be used in the gravity, pressure, or tankless booster systems with considerable savings in installation costs and operation.

For complete information on the "Turret" Pump ask for Bulletin 1200.

HERE'S HOW IT OPERATES

As can be seen, the "Turret" fits right in the pipe line. The liquid is pumped by a semi-steel, accurately balanced impeller operated by a vertical motor. In the gravity system, a float switch located near the storage tank automatically controls the supply of water. In the pressure system and tankless booster system, a pressure regulator automatically controls the water pressure supplied.

The "Turret" Pump guarantees uninterrupted performance. Architects and engineers who specify it will never have any regrets.

WITH A GRAVITY SYSTEM

The diagrammatic sketch below indicates the "Turret" Pump in use in the gravity type of cold water supply system. The pump, located in the basement together with the automatic control panel, pumps city water to the storage tank which is located on the roof. From this tank the water is then supplied to the various fixtures in the building by gravity.

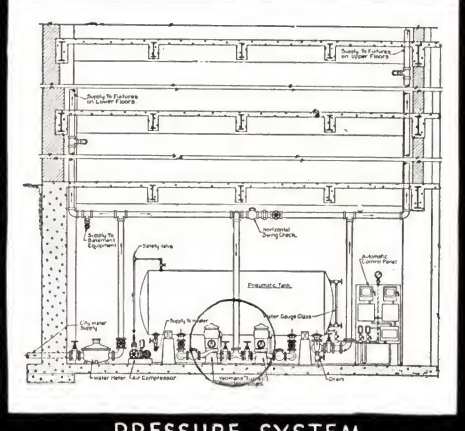
WITH A PRESSURE SYSTEM

In a pressure system, the "Turret" Pump and the automatic control panel, together with the pneumatic storage tank are located in the basement. City water supply is pumped into the tank by the "Turret" Booster. Compressed air is also supplied to the tank by a compressor which furnishes the required volume of air to maintain the air cushion in the tank. The pressure built up by the "Turret" Pump is sufficient to force the water to the various plumbing fixtures.

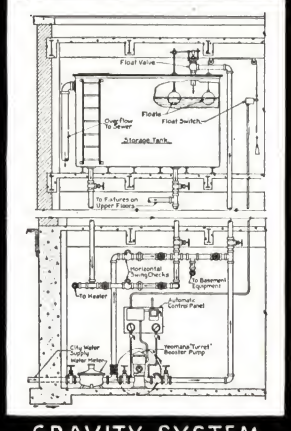
WITH A TANKLESS BOOSTER SYSTEM

For the Tankless Booster system, the "Turret" Pump makes an ideal booster. It greatly simplifies pipe connections and valving, and reduces the cost of installation. In this system no tanks are used. The "Turret" is inserted in the city water supply line supplying water to the various fixtures. It operates only when city pressure is inadequate to supply proper water pressure at upper floor fixtures.

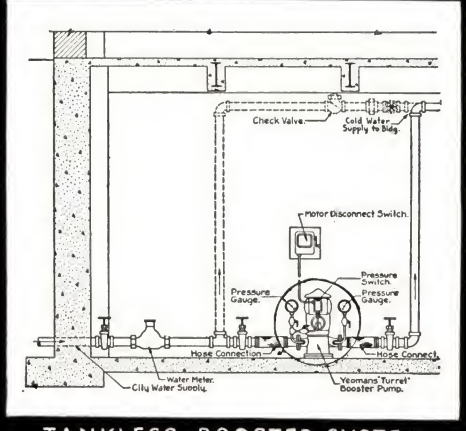
• "TURRET" PUMP ARRANGEMENTS FOR WATER SUPPLY SYSTEMS •



PRESSURE SYSTEM

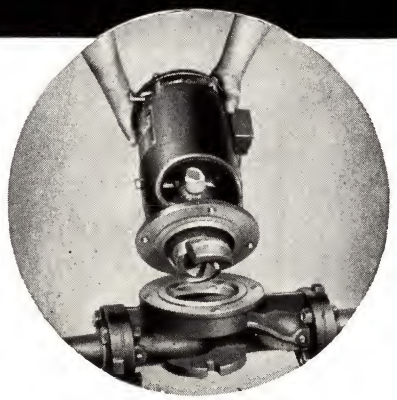


GRAVITY SYSTEM



TANKLESS-BOOSTER SYSTEM

YEOMANS PUMPS FOR WATER SUPPLY



OUTSTANDING ADVANTAGES OF THE "TURRET" PUMP

WHERE space is limited, where frequent inspection is necessary, as in the food industry, and where a better appearing pump is desired, the "Turret" Pump is the natural selection for the architect.

Here are listed a few of its many advantages over other types of pumps.

● **Widest Application:** The "Turret" Pump can be used for practically any pumping problem. It can be used for handling hot or cold liquids, foods, acids, alkalis. It fits right into the pipe line. Therefore a minimum of floor space is required, and total costs are reduced through simplified piping connections.

● **Light and Compact.** As can be seen from the illustration, the "Turret" is light in weight, is easily handled, and easily assembled.

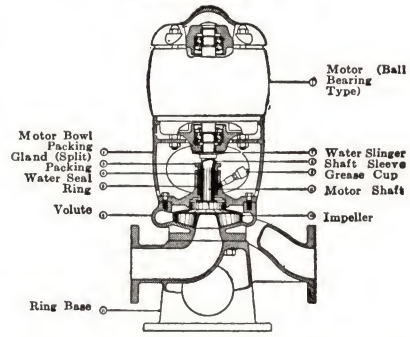
● **Positive Alignment.** There are no couplings in the "Turret".

● **No Pump Bearings.** The "Turret" has no bearings in the pump casing, thus preventing grease or oil from entering the liquid being pumped.

● **Accessibility without disturbing piping.** The "Turret" Pump can be quickly inspected without breaking any connections, and it can be just as easily re-assembled.

● **Removable Bronze Shaft Sleeve:** In the "Turret" Pump the shaft sleeve is pressed on the motor shaft and locked in place. This eliminates wear of the shaft. The sleeve can also be replaced without disassembling the motor.

● **No foundation needed:** No supports are needed for the smaller size "Turret" Pump. The larger sizes are supplied with a cast iron base. No built-up foundations are necessary.



SPECIFICATIONS FOR WATER SUPPLY SYSTEMS

GRAVITY SYSTEM

PUMP: Furnish and install where indicated on plans a single (or duplex) automatically controlled electric driven "Turret" Pump as manufactured by Yeomans Brothers Co., having a capacity of_____GPM while delivering water into roof tank against a static head of_____ feet with the aid of_____pounds city pressure at pump suction.

MOTOR: Pump shall be driven by vertical _____HP_____RPM ball-bearing motor suitable for current available at building.

CONTROL APPARATUS: The control shall consist of a Yeomans single pole enclosed float switch with accessories for mounting in penthouse and a single control panel with enclosed automatic starter (with overload protection for polyphase motor) and a 3-pole enclosed externally operated fused safety switch mounted at pump location.

PRESSURE SYSTEM

Furnish and install where indicated on plans a Yeomans single (or duplex) automatic electric pressure type water supply system, including electric motor-driven centrifugal pump, compression tank, automatic control apparatus, and independent motor-driven air compressor with manual control.

PUMP: Shall be close-coupled vertical "Turret" Pump as manufactured by Yeomans Brothers Co., with inlet and outlet connections on same centerline, and having a capacity of_____ GPM while maintaining a pressure of_____ pounds with the aid of_____pounds city pressure.

MOTOR: Pump shall be driven by vertical _____HP_____RPM ball-bearing motor suitable for current available at building.

CONTROL APPARATUS: Furnish Yeomans single control panel having enclosed automatic starter, diaphragm type pressure regulator, fused safety switch, pressure gauge and manual starting switch for air compressor.

MOTOR DRIVEN AIR COMPRESSOR: Furnish a single cylinder air cooled air compressor having a capacity of_____cu. ft. of free air per minute against maximum pressure of_____pounds. Compressor to be mounted on separate base plate and driven through V belt drive by_____ HP motor. Provide ½" relief valve for air line.

PRESSURE TANK: Furnish and install_____ inch diameter by_____ft. long steel pressure tank suitable for a working pressure of_____ pounds, and to conform to local requirements. Tank to be provided with necessary inlet and outlet and drain connections, ½" tapping for air compressor line and tapping for water glass cocks and pressure gauge.

TANKLESS BOOSTER SYSTEM

Furnish and install where shown on plans one Yeomans Tankless Booster system complete with motor driven pump, automatic control and accessories.

PUMP: Shall be "Turret" Pump as manufactured by Yeomans Brothers Co., with inlet and outlet connections on same centerline, and having a capacity of_____GPM while maintaining a minimum water pressure of 10 pounds at top-floor fixtures with the aid of_____ pounds city pressure at pump suction.

MOTOR: Pump shall be driven by vertical _____HP_____RPM ball-bearing electric motor suitable for current available at building.

AUTOMATIC CONTROL: Pump shall be provided with diaphragm type pressure regulator, adjusted to start pump automatically during periods when city pressure drops below_____ pounds, and to stop pump when city pressure is restored to_____pounds. When operating, pump shall boost water pressure at least _____ pounds above city pressure supplied to pump. Provide pressure gauges and rubber hose connections to both suction and discharge connections of pump.

BYPASS: Install bypass between city service and main supply to fixtures.

"TURRET" PUMP SELECTION TABLE

Capacity In G.P.M.	TOTAL HEAD IN FEET																											
	20				30				50				70				100				125				150			
	Pump No.	Size In.	H.P Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In.	H.P. Motor	R.P.M.	Pump No.	Size In	H.P. Motor	R.P.M
15	75	¾	¼	1750	73 75	¾ ¾	¼ ⅓	3500 1750	73	¾	⅓	3500	75	¾	1	3500	75	¾	1 ½	3500	75	¾	2	3500	75	¾	3	3500
25	73 100	¾ 1	⅓ ½	3500 1750	73 100	¾ 1	½ ½	3500 1750	73	¾	¾	3500	75	¾	1 ½	3500	75	¾	2	3500	75	¾	3	3500	75	¾	3	3500
50	150	1 ½	½	1750	100 150	1 1 ½	1 ¾	3500 1750	100 101	1 1½	1 ½ 2	3500 1750	150 101	1 ½ 1½	2 2	3500 1750	150	1 ½	3	3500	150	1 ½	5	3500	150	1 ½	5	3500
75	150 150	1 ½ 1 ½	1 ¾	3500 1750	150 150	1 ½ 1 ½	1 1	3500 1750	150 101	1 ½ 1 ½	1 ½ 2	3500 1750	150	1 ½	3	3500	150	1 ½	3	3500	150	1 ½	5	3500	150	1 ½	5	3500
100	150 150	1 ½ 1 ½	1 1	3500 1750	150 200	1 ½ 2	1 ½ 1	3500 1750	150 101	1 ½ 1 ½	2 3	3500 1750	150 301	1 ½ 3	3 5	3500 1750	150 301	1 ½ 3	5 7½	3500 1750	150	1 ½	5	3500	150	1 ½	7 ½	3500
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200	400	4	1 ½	1750	300 400	3 4	3 2	3500 1750	200 301	2 3	5 5	3500 1750	300 301	3 3	5 7½	3500 1750	300 401	3 4	7 ½ 10	3500 1750	200	2	10	3500	300	3	15	3500
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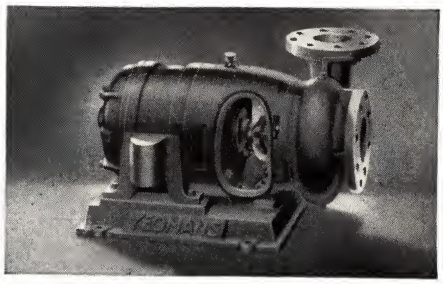
300	400 400	4 4	3 2	3500 1750	300 400	3 4	5 3	3500 1750	300 401	3 4	7 ½ 7 ½	3500 1750	300 401	3 4	7 ½ 10	3500 1750	300 501	3 5	10 15	3500 1750	300	3	15	3500	300	3	20	3500

YEOMANS PUMPS

FOR CIRCULATION AND WATER SUPPLY

WHERE CIRCULATING PUMPS ARE USED . . .

The circulating pumps described below have various uses. They can be used for pumping brine, acid, alkali. They are exceptionally efficient in circulating drinking water and hot water. They find service in swimming pools, greenhouses, and air conditioning plants—in short, wherever liquids or semi-liquids are to be pumped.

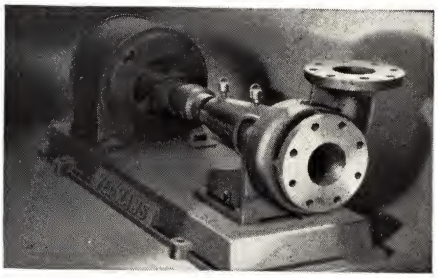


THE "MOTOPUMP" CLOSE-COUPLED CENTRIFUGAL

This substantial unit is designed for general service including the handling of hot and cold water, brine, and other liquid circulation. Designed without couplings or intermediate bearings, this pump is compact and flexible. It requires no built up foundation; it may be bolted to floor, wall, or ceiling. There are no bearings inside the pump casing. The impeller is balanced, keyed and locked to the shaft, and factory fitted, requiring no field adjustment. Capacities range from 10-600 GPM. heads from 10-300 feet.

YEOMANS CENTRIFUGAL PUMPS BALL BEARING

This pump is used for pumping high temperature liquids, foodstuffs, certain acids, liquids containing abrasives, etc. The two large ball bearings are outside and independent of the pump casing. This pump is free from vibration and critical speeds. Frictionless all-metal piston ring seal protects the bearings. Construction is extra heavy, and includes a semi-steel, semi-enclosed impeller with efficiencies equaling and exceeding those of highly finished enclosed types. Capacities range from 10-600 GPM, heads from 10-300 feet.



PUMP CAPACITIES FOR VARIOUS SIZES OF PIPE LINES

Pipe Size Inches	Hot Water Heating—G.P.M.	Domestic Hot Water Supply G.P.M.	Drinking Water* G.P.M.	Cooling Water G.P.M.
1	5-10	½-1	10-15	5-10
1¼	10-20	1-2	15-30	10-20
1½	20-30	2-3	30-45	20-30
2	30-60	3-4	45-85	30-60
2½	60-85	4-6	85-150	60-85
3	85-150	6-10	150-250	85-150
4	150-325	10-17		150-325

*Capacity should be consistent with number of fixtures supplied. Where individual cooling units are used, refer to the company for capacity.

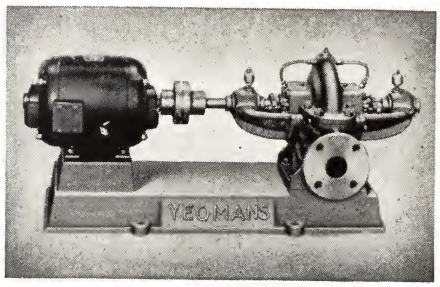
In each case the capacity of the pump should be consistent with the capacity of the heating or refrigerating element, and in no case exceeds its capacity.

For hot water heating and cooling water circulating systems the pump capacity should equal the maximum requirements of the system. For domestic hot water and drinking water circulating systems, the pump capacity should be proportional to the distance of the fixtures from the heater or refrigerator element.

In figuring the head on a pump for a closed or balanced circulating system, the total friction of the system may be taken as the total head on the pump, except in the case of drinking water circulating, in which case the total head on the pump is approximately 50% greater than the estimated friction of the system.

Circulating systems in which the return lines empty into an open tank, and the pump does not have the advantage of the return suction pressure, the head on the pump is increased by an amount equal to the static head against which it must operate, and this amount must be added to the friction head to obtain the total head on the pump.

The character of the insulation of the pipe line is also a factor to be considered. For the average installation, the above table gives the desirable pump capacity for various size of pipe lines.



YEOMANS HORIZONTALLY SPLIT CASE PUMPS FOR WATER SUPPLY AND CIRCULATION IN BUILDINGS

This pump is used for house supply and general service—usually in large installations. It is designed for easy maintenance, and may be inspected without disturbing piping. The impeller is balanced, enclosed. Bearings are ball or roller type, insuring smooth operation and long life. Equipped with extra deep stuffing boxes with bolted glands. Also available in multi-stage type. A highly efficient and satisfactory pump for capacities of 25-1000 GPM, and heads up to 400 feet. Described in Yeoman's fully illustrated Bulletin HS-1300.

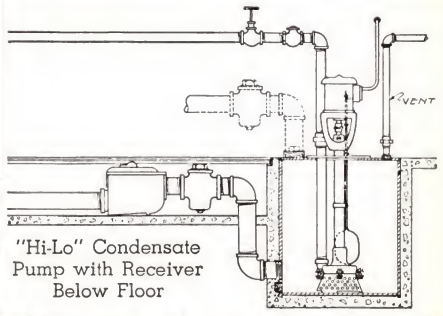
YEOMANS PUMPS FOR HEATING SYSTEMS

THE USE OF PUMPS IN HEATING SYSTEMS

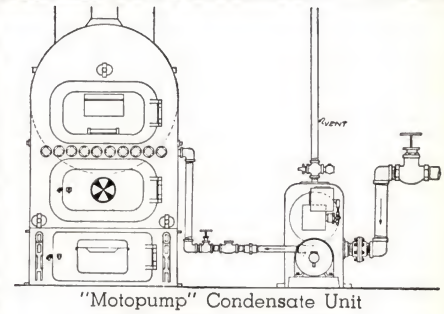
IN many heating installations it is necessary to place radiation or heating units below the boiler water line. In such cases it is only necessary to provide a pump of sufficient capacity to handle the condensate from these units, allowing condensate from radiation on upper floors to return to the boiler by gravity.

These pumps, when properly selected, often make poorly constructed heating systems work better, and also afford great saving of fuel. With gas or oil fired boilers they are often the means of overcoming most of the operating difficulties.

The Yeomans Condensation Pumps and Receivers described below are designed for automatically returning condensate to boilers from gravity steam heating systems.



"Hi-Lo" Condensate Pump with Receiver Below Floor



"Motopump" Condensate Unit with Receiver Above Floor

"HI-LO" CONDENSATION RETURN PUMP

This unit is designed for automatically receiving and returning condensate to boilers from high or low returns in gravity type systems. Three sizes are available having capacities ranging from 1 to 10000, 15000, 20000 and 30000 sq. ft. of direct radiation against pressures of 10, 15, 20, and 30 pounds.

No other condensate return pump combines Yeomans advanced features. "Hi-Lo" is entirely rustproofed. It is quickly installed—comes ready to plug in. Among its many features are high efficiency, liberally rated ball bearing motor, low operating cost, built-in automatic control, enclosed bronze impeller, heavy duty sealed bearings, and a copper-bearing steel receiver 24 inches in diameter by 28 inches deep furnished with cast iron steam tight cover.

TABLE OF SIZES

Unit No.	Rating Sq. Ft. Dir. Radiation	Discharge Pressure Lbs.	Max. Pump Cap. G P M	Motor H.P.	Speed R.P.M.
HL-10	5000	10	7½	½	1750
	10000	10	15	½	1750
	15000	10	22½	½	1750
	30000	10	45	½	1750
HL-20	5000	20	7½	½	3500
	10000	20	15	½	3500
	15000	15	22½	½	3500
HL-30	5000	30	7½	¾	3500
	10000	30	15	¾	3500
	15000	20	22½	¾	3500

"MOTOPUMP" CONDENSATION RETURN UNITS

"MotoPump" is designed for gravity steam heating systems where the return lines are sufficiently high above the boiler room floor to permit mounting the pump on concrete foundations or on the boiler room floor. It is not recommended for installation in pits. Small size, compactness, and unusually high efficiency are the most prominent characteristics of "MotoPump". A small motor and low operating cost are the natural results of such high pump efficiency. Construction features include elimination of couplings. A special enclosed bronze impeller is largely responsible for the performance records of "MotoPump". But every other detail has also been worked out with typical Yeoman thoroughness to contribute its part to the effectiveness of the complete unit.

Capacities range from 1000 to 100000 sq. ft. of direct radiation, and for pressures up to 100 pounds. Units for higher pressures can also be supplied. Ask for Bulletin 5000.

VERTICAL CONDENSATION UNITS

For those installations where return lines are located below the floor, or are otherwise too low for horizontal pumps, the Yeomans Type V (with cast iron receiver and cover) and Type VS (with steel receiver and cover) vertical condensation return units are used. These pumps are available in sizes ranging from 1000-100000 sq. ft. of radiation against pressures of 10-100 pounds. For more complete data write for Bulletin C5400.

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Throughout the civilized world, pumps bearing this familiar trade mark are working night and day. Let the trustworthy Yeomans name be your guide in the specifying of precision pumps for any use.